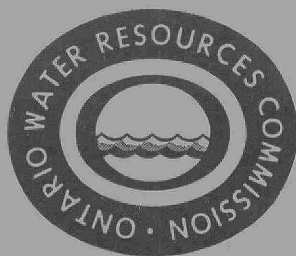


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O.W.R.C.
Water Pollution
Survey

THE
ONTARIO WATER RESOURCES
COMMISSION



WATER POLLUTION SURVEY

of the

TOWNSHIP OF DYMOND

1970

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Report

on a

Water Pollution Survey

of the

TOWNSHIP OF DYMOND

District of Timiskaming

May 1970

DISTRICT ENGINEERS BRANCH
DIVISION OF SANITARY ENGINEERING

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R E P O R T

THE ONTARIO WATER RESOURCES COMMISSION

INTRODUCTION

The Ontario Water Resources Commission is concerned with the management of the province's water resources as they are related to the needs of water supply, wastewater disposal and other areas of use. In keeping with the responsibility the Commission examines water quality in areas of active and potential use. This survey was made to locate and record any significant sources of water pollution in the Township of Dymond and to make recommendations concerning their abatement. In July of 1969, water samples for bacteriological and chemical examination were collected from surface waters and all of the known discharges to these waters. The results of certain samples collected by the Timiskaming Health Unit and samples collected during routine OWRC inspections of the sewage works facilities in the township are also used in this report. The appendix to the report includes the results of the samples collected in July 1969, an interpretation of the various tests, and an outline of water-quality and effluent objectives for water in Ontario. A map of the township showing the sample point locations is also appended.

I GENERAL

(1) Location

The Township of Dymond has an assessed population of 1,014 (1970 Municipal Directory) and is located in the District of Timiskaming. The Town of New Liskeard, located on Highway 11 approximately 100 miles north of North Bay, borders on the south-eastern portion of the township and the westerly shore of Lake Timiskaming. There is some residential and commercial development on Highway 11 just north of New Liskeard. There is no industry located in the township.

Drainage in the majority of the township is directed to Wabi Bay and Lake Timiskaming by the Wabi River and its tributaries. This drainage basin is depleted by the Wabi River flowing diagonally across the township from the north-west to the south-east where it empties into Lake Timiskaming at New Liskeard. The South Wabi River drains the south-western portion of the township before joining the Wabi River. It should be pointed out that any pollution originating in the Township of Dymond will affect the Town of New Liskeard and its public beaches.

(2) Topography

The Township of Dymond is part of a clay belt farmland primarily composed of the varved clay and silts typical of the clay belts of Northern Ontario. Generally the

terrain is of a flat or rolling nature with no rock close to the surface.

II WATER USES

(1) Water Supply

There is no municipal water works in the township. Water is obtained from private wells. Reportedly, the water quality of private wells located in an area of commercial development on Highway 11 just north of New Liskeard has been satisfactory. Results of bacteriological examinations by the Timiskaming Health Unit show several of the private wells in other areas of the township to be of doubtful or unsatisfactory quality. However, due to the limited number of tests on well water a general statement of the water quality cannot be made. Field observations at the time of the survey would seem to attribute most adverse results to poor construction and/or location of wells relative to waste disposal systems.

There are two water supply systems located in the township. The Breault system serves the Breault restaurant and service station and a subdivision of approximately 18 houses. The system is supplied by a drilled well, and is untreated.

The Maille system also untreated, serves a new development of approximately 8 homes on the west side of Highway 11, north of the cluster of motels and service stations.

The Timiskaming Health Unit reports that all bacteriological samples from these systems have been of excellent quality.

(2) Recreational

Although there is no extensive use of the Wabi River and its tributaries for recreation within the township itself, the New Liskeard Beach, extending for almost a mile along the shore of Lake Timiskaming is an extremely popular swimming area serving the residents of the area and many tourists. The importance of having water of good sanitary quality in this area is obvious. The Wabi River is also used to a minor extent for swimming. The Wabi River empties into Lake Timiskaming at New Liskeard close to the public beach.

III POLLUTION CONTROL

(1) Sanitary Waste Disposal

There are no municipal sanitary sewers. Private sewage disposal is accomplished by septic tanks and tile fields, cesspools, privies and waste stabilization ponds.

(a) Individual Facilities - the disposal of sanitary wastes by individual facilities is made difficult by the heavy clay overburden that prevails throughout this claybelt region.

In order for a septic tank and tile system to work

efficiently the soil must be suitable for the absorption of effluent, i.e. an acceptable percolation rate without interference from ground water or impervious strata below the level of the absorption system. These conditions do not prevail in the township.

(b) Commercial Facilities - sewage disposal for the limited commercial development on Highway 11 just north of New Liskeard is presently comprised of five individual waste stabilization ponds serving the business enterprises. There has been no major problems with the overall operation of these ponds and thus far no effluent discharge from them. However, there have been occurrences of the banks of the Husky Travel Centre lagoon breaking open allowing the contents to flow down a roadside ditch contaminating private wells along Highways 11 and 11B. This problem should be rectified.

Currently there are a number of outstanding recommendations before the owners of these five ponds resulting from routine OWRC inspections to improve their operation. It should be noted that OWRC approval was not obtained prior to the initial construction of these facilities.

Many complaints have been received with regard to the lack of adequate sewage disposal facilities at the Fina service centre and restaurant. The provision of a properly designed waste stabilization pond is presently under

recommendation by the Ontario Water Resources Commission and subsequent action is pending. The conditions evident at the time of the field survey contributed a health hazard with nuisance odours and unsightly appearance. Adequate sewage treatment should be implemented as soon as possible.

(2) Refuse Disposal

Refuse is disposed of on municipally owned land in the Township of Dymond, by a sanitary landfill operation. There is no evidence of any adverse effects which this operation may have on surface waters in the area.

IV SAMPLE ANALYSIS

The laboratory results of the bacteriological examination and chemical analysis of the samples collected from the Wabi River and its watercourses, and sewer outfalls are appended to this report.

All bacteriological samples were submitted to and examined by the Public Health Laboratory in North Bay, while all chemical samples were analysed at the Ontario Water Resources Commission Laboratory in Toronto.

A plan of the Township of Dymond is appended. This plan shows the location of water pollution control plants, sewer outfalls, and the approximate locations of sampling points.

During the survey, a sample obtained from a

drainage ditch along Highway 65 near Highway 11B shows evidence of a BOD of 22.0 ppm, a MPN coliform count of greater than 110,000 and a suspended solids content of 210 ppm, all in excess of the OWRC objectives of 15.0 ppm, 2400, and 15.0 ppm respectively. Samples obtained further along the creek connected to the drainage ditches, but still upstream of the junction to the Wabi River, showed no significant indication of stream pollution.

Analysis of samples taken from the Wabi River at its extreme northern point in the township and at its mouth to Lake Timiskaming, indicate satisfactory results.

Two samples from a creek located in a ravine running just behind a number of homes in the Highway 65 and Dymond Road No. 2 area, indicated MPN coliform counts of 3400 and 8400 coliforms per 100 ml. Both these values are in excess of the OWRC objective of 2400 coliforms per 100 ml. A sample obtained downstream of the above area on the South Wabi was of satisfactory quality. Another sample was obtained in the vicinity of one of the sewage outfalls evident along the ravine. The analysis results showed a coliform count of 5900 coliforms per 100 ml, exceeding OWRC objectives, and a high free ammonia content of 0.56 ppm.

A number of samples taken from various watercourses emptying into the Wabi River all were of satisfactory quality.

Two samples obtained from the Wabi River upstream of New Liskeard and at the mouth to Lake Timiskaming were also of satisfactory water quality.

V DISCUSSION

During the survey field studies, sodium fluorescein dye was flushed through several sewage disposal facilities. It was evident that in most cases there was no retention time at all; raw sewage was being discharged directly to watercourses emptying into the Wabi River.

Drainage ditches along the residential areas on Highway 11B near the bypass contained pools of inadequately treated sewage causing unsightly and malodorous conditions. Reportedly, during periods of heavy rainfall as in the early summer months, a considerable amount of practically raw sewage flows through these ditches that cross Highway 11 to enter the Wabi River just upstream of New Liskeard.

In the area of Highway 65 and Dymond Road 1, dye tests revealed many discharges of untreated sewage from septic tank outfalls to streams flowing directly to the Wabi River. Also in this case, offensive odours were apparent.

This type of situation is obviously a public health hazard since these contaminants are being discharged in areas where children are playing and therefore accessible to them. There is also a definite threat of contamination of drinking

water supplies of the residents in the area since private wells are the only drinking water source. This is evident from the many unsatisfactory results of samples obtained by the Health Unit from residences in these areas.

Due to the unsatisfactory soil conditions, it is not likely that adequate domestic waste treatment may be obtained by the septic tank and tile field system. If the domestic waste disposal problem cannot be corrected on an individual basis, a communal collector and treatment system would be the only solution. However, the scattered location of homes would dictate an extensive collection system, along with associated pumping stations owing to the rolling terrain. A cost-feasability study would have to be made of such a solution.

Although the Wabi River and its main tributaries within the township boundaries were in good condition, there remains the very definite threat of stream impairment from those areas with unsatisfactory sewage treatment facilities. The public health hazard created by these problems warrants immediate attention. The public beaches adjacent to the mouth of the Wabi River on Lake Timiskaming demand satisfactory water quality from the river.

VI SUMMARY AND CONCLUSIONS

A water pollution survey of the Township of Dymond

was conducted in July of 1969.

In general, the Wabi River and its tributaries within the township were in good condition. The main pollution problem present in the Township of Dymond is in the central portion of the township and just north of the New Liskeard town limits. The absence of treatment facilities or malfunctioning septic tank systems results in the discharge of inadequately treated sewage to drainage ditches and streams flowing into the Wabi River. Contamination of private drinking water supplies is also evident in these areas.

The commercial development just north of New Liskeard on Highway 11 is served by individual waste stabilization ponds and private wells. The present conditions in this area can be made adequate once the OWRC recommendations concerning operation are implemented. One exception is the lack of sewage treatment facilities at the Fina Centre and restaurant, which is under recommendation.

The varved clay and silt soil conditions evident throughout the township adversely affect sewage treatment by the septic tank and tile field operation. A communal collector and treatment system is one possible solution, although a cost feasibility study would have to be made of such a proposal to determine its practicability.

VII RECOMMENDATIONS

- (1) The Timiskaming Health Unit should make an investigation of the existing septic tank installations in the area and take appropriate action where malfunctioning facilities are encountered.
- (2) Inspections of septic tank sites should be made by the Timiskaming Health Unit before a building permit is issued, with a final inspection of the installed works.
- (3) Adequate sewage treatment facilities for the Fina Service Centre and restaurant must be implemented as soon as possible.
- (4) The Township of Dymond should prepare and adopt an Official Plan, approved by the Minister of Municipal Affairs, so as to govern the future development of the township.
- (5) Action should be taken so that there is no recurrence of the berms breaking open on the Husky service centre waste stabilization pond.

VIII ADDENDUM - APRIL 1970

The conditions discussed in this report prompted the township to engage a consultant to undertake a feasibility study of a communal sewage treatment system. In this regard, the consultant is proposing a collector system and waste stabilization pond to serve the motel complex area and a proposed school on Highway 11, also picking up homes along Highways 11 and 11B down to the townline. This study was

underway at the time of writing.

The completed system if constructed, would eliminate all sewage disposal problems in the above mentioned area, leaving the remaining area near Highway 65 and Dymond Road No. 2 to be rectified.

/elc

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R. C. Newman

J.D. Snider, Technologist,
for Div. of Sanitary Engineering.

are, in general, relatively few in number in other stream pollutants.

Biochemical Oxygen Demand (BOD) - The biochemical oxygen demand test indicates the amount of oxygen required for stabilization of the decomposable organic matter found in sewage, sewage effluent polluted waters, or industrial wastes, by aerobic biochemical action.

Solids - The analyses for solids include tests for total suspended and dissolved solids. The total solids is a measure of the solids in solution and in suspension. Suspended solids indicate the measure of undissolved solids of organic or inorganic nature whereas the dissolved solids are a measure of those solids in solution.

Oils and Ether Soluble Materials - These include oils and all other soluble materials such as tarry substances and greases. The presence of these pollutants renders water difficult and sometimes impractical to treat either for industrial or domestic use. Oils make streams unsightly and water unfit for bathing.

Phenolic Compounds - Phenols react with chlorine to produce intensely aromatic compounds. These compounds, even when highly diluted, may give a taste and odour to the water which is variously described as medicinal, chemical or iodoform. Phenols taint fish and are toxic to fish, depending on the concentration. Normal water contains no phenolic compounds.

Alkyl Benzene Sulfonate (ABS) - The alkyl benzene sulfonate portion of the anionic detergents is reported in ppm. The test is generally employed to indicate the presence of domestic wastewater. The

popular use of synthetic detergent for general cleaning purposes have resulted in the incidence of residual ABS in streams. As an objective, the ABS concentration should not exceed 0.5 ppm in water used for domestic purposes.

Nitrogen

Ammonia Nitrogen - or sometimes called free ammonia is the insoluble product in the decomposition of nitrogenous organic matter. It is also formed when nitrates and nitrites are reduced to ammonia either biologically or chemically. Some small amounts of ammonia, too, may be swept out of the atmosphere by rain water.

The following values may be of general significance in appraising free ammonia content: Low 0.015 to 0.03 ppm; moderate 0.03 to 0.10 ppm; high 0.10 or greater.

Total Kjeldahl - is a measure of the total nitrogeneous matter present except that measured as nitrite and nitrate nitrogens. The Total Kjeldahl less the Ammonia Nitrogen measures the organic nitrogen present. Ammonia and organic nitrogen determinations are important in determining the availability of nitrogen for biological utilization. The normal range for Total Kjeldahl would be 0.1 to 0.5 ppm.

Nitrite Nitrogen - Nitrite is usually an intermediate oxidation product of ammonia. The significance of nitrites, therefore, varies with their amount, sources, and relation to other constituents of the sample, notably the relative magnitude of ammonia and nitrate present. Since nitrite is rapidly and easily converted to nitrate, its presence

in concentrations greater than a few thousands of a part per million is generally indicative of active biological processes in the water.

Nitrate Nitrogen - Nitrate is the end product of aerobic decomposition of nitrogenous matter, and its presence carries this significance. Nitrate concentration is of particular interest in relation to the other forms of nitrogen that may be present in the sample. Nitrates occur in the crust of the earth in many places and are a source of its fertility.

The following ranges in concentration may be used as a guide. Low less than 0.1 ppm; moderate 0.1 to 1.0 ppm; high greater than 1.0 ppm.

Hardness - The hardness of water reflects the nature of the geological formations with which it has been in contact. Hard waters are as satisfactory for human consumption as soft waters. Waters with a hardness of 75-100 ppm are considered moderately hard and waters with a hardness of 150-300 ppm are classified as hard.

Alkalinity - The alkalinity of natural waters is caused by three major classes of materials which may be ranked in order of their effect or pH as follows: (1) hydroxides (2) carbonates and (3) bicarbonates and other salts of weak acids. The alkalinity of a water has little sanitary significance but is of importance in water, sewage and industrial waste treatment practices.

Iron - The OWRC Drinking Water Objectives set a limit of 0.3 ppm for iron. This limitation is based on consideration of appearance rather than health.

Chlorides - Chlorides in reasonable concentrations are not harmful to humans. At concentrations above 250 ppm they give a salty taste to the water which is objectionable to many people. For this reason, the OWRC Drinking Water Objectives recommends that chlorides be limited to 250 ppm in supplies intended for public use.

pH - The pH value, for practical purposes, refers to acidity or alkalinity, and is a measure of intensity rather than quantity. The pH scale extends from zero (very acidic) to 14 (very alkaline), with the middle value of 7 corresponding to neutrality at 25°C Centigrade. The pH of surface water should be in the range of 6.7 to 8.5.

Colour and Turbidity - Although these tests do not directly measure the safety of the water, they are related to consumer acceptance of the water. At levels in excess of 5 units of colour and 1 unit of turbidity in the raw water consumers acceptance may be conditional upon treatment of the water.

TOWNSHIP OF DYMOND

Sampling Point No.	Description	Date	5-Day BOD (ppm)	S O L I D S			M P N		Free Ammonia As N
				Total (ppm)	Susp. (ppm)	Diss. (ppm)	Total Coliform Organisms	Faecal Coliform Organisms	
D - 1	Creek flowing into Wabi River at Dymond Rd. No. 2.	July 15/69	1.4	320	40	280	64	28	0.02
D - 2	Creek flowing through Grant's across Hwys. 11 and 11-B upstream of jct. with Wabi River Taken at Hwy. 11.	July 15/69	2.5	900	15	885	76	0	0.14
D - 3	Hillview Creek upstream of junction with Wabi River at Hwy. 65	July 16/69	1.8	360	20	340	3400	200	0.07
D - 4	Hillview Creek upstream of junction with Wabi River at Dymond Rd. No. 2.	July 16/69	1.8	340	20	320	8500	8100	0.05
D - 5	Drainage creek from McLean farm just upstream of junction with Wabi River.	July 16/69	4.5	620	100	520	2100	100	0.18

TOWNSHIP OF DYMOND

Sampling Point No.	Description	Date	5-Day BOD (ppm)	S O L I D S			M P N		
				Total (ppm)	Susp. (ppm)	Diss. (ppm)	Total Coliform Organisms	Faecal Coliform Organisms	Free Amm. as N
D - 6	Hillview Creek at Dymond Rd. No. 1 upstream of Hwy.65 area.	July 16/69	2.0	220	15	205	0	0	0.16
D - 7	Creek upstream of junction with Wabi River at Dymond Rd. No. 3.	July 16/69	2.5	470	125	345	700	0	0.03
D - 8	Drainage ditch along Hwy. 11 near Hwy. 11 - 8.	July 17/69	2.0	1480	15	1465	268	108	-
D - 9	Drainage ditch North side of Hwy.65 at Hwy. 11-B.	July 17/69	22.0	1290	210	1080	11,000+	620	0.15
D - 10	Creek at Dymond Rd. No. 5, just above Hwy. 65, upstream of junction with Lake Timiskaming.	July 17/69	2.5	420	20	400	76	48	0.07

TOWNSHIP OF DYMOND

Sampling Point No.	Description	Date	5-Day BOD (ppm)	S O L I D S			Total Coliform Organisms	Faecal Coliform Organisms	Free Ammonia as N
				Total (ppm)	Susp. (ppm)	Diss. (ppm)			
W - 0.0	Wabi River at mouth to Lake Timiskaming	July 15/69	1.0	80	15	65	8	0	0.08
W - 1.1	Wabi River at end of road on east bank just above New Liskeard	July 15/69	1.2	140	30	110	Questionable Result		0.07
WO - 1.4	Wabi River at Hwy.11	July 15/69	1.2	130	30	100	8	0	0.06
W - 2.8	Wabi River at Hillview Line	July 15/69	1.4	120	25	95	0	0	0.30
WS - 5.0	South Wabi River at O.N.R. tracks upstream of jct. with Wabi River.	July 15/69	1.6	130	35	95	92	76	0.02
WS - 5.5	Wabi River near junction of Dymond Rd. No. 2 and Hwy. 65 at bridge.	July 17/69	0.8	140	45	95	76	4	-
WA - 6.3	Hanbury Creek at Uno Pk. Road upstream of jct. with Wabi River.	July 15/69	2.5	350	30	320	48	0	0.10
		July 15.69	1.2	140	30	110	56	56	0.07
WS - 6.9	South Wabi River at first road north of south township line.	July 17/69	1.0	190	45	145	120	32	-

TOWNSHIP OF DYMOND

Sampling Point No.	Description	Date	5-Day BOD (ppm)	S O L I D S			Total Coliform Organisms	Faecal Coliform Organisms	Free Ammonia as N
				Total (ppm)	Susp. (ppm)	Diss. (ppm)			
W - 7.0	Wabi River at Uno Park Road.	July 15/69	2.0	130	30	100	24	0	0.06
P - 1	Adjacent to Sewage Outfall from first residence west of Dymond Rd. No. 2 near junction of Hwy. 65.	July 16/69	3.0	350	15	335	5900	5900	0.56



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Out
Environ
Water
treat



- LEGEND**
- WS-6.9 STREAM SAMPLING POINT SHOWING MILEAGE
 - D-11 STREAM SAMPLING POINT
 - P-2 OUTFALL SAMPLING POINT
 - OUTFALL SYMBOL
 - P PRIVATE SEWER
 - WASTE STABILIZATION POND

ONTARIO WATER RESOURCES COMMISSION	
TOWNSHIP OF DYMOND	
W. P. S. 1969	
<i>Water pollution survey</i>	
SCALE: 0 1/3 2/3 1 MILE	
DRAWN BY: R. HUNT	DATE: AUGUST, 1969
CHECKED BY:	DWG. NO: 69-130-D.E.



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